Appl. No.: 10/709,677
Amdt. Dated: 1/12/2007
Reply to Office action of: 11/21/2006

AMENDMENTS TO THE DRAWINGS:

There are no amendments to the drawings being presented herewith.

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REMARKS/ARGUMENTS

Claims 1 – 19 remain in this application. Claims 1 and 11 have been amended to correct minor grammatical and editorial errors.

No new matter has been introduced by these amendments.

Applicants point out that there have only ever been nineteen claims in this application even though the Examiner states that there are twenty claims.

Applicants originally properly requested this application be filed as a National Stage application of PCT/ES01/00462 under 35 U.S.C. §371 as evidenced by the original as shown by the original Application Data Sheet submitted to the USPTO with the application and filing fee (3 page copy attached for the Examiner's convenience) as well as the original filing document in the PAIR system (copy attached for the Examiner's convenience). Applicants also cancel any request for priority based upon the publication number. Thus clearly this application properly requested and claimed the original PTO filing and provided the WIPO publication number showing the US as one of the originally designated countries of this original PCT application filing. In light of these facts this matter of priority is clear and resolved. The fact that the USPTO has listed the incorrect PCT number in the PAIR database under priority does not change the fact that this application correctly and timely identified its PCT parent application and requested the 35 U.S.C. §371 filing status.

Claims 1 and 11 have been objected to because of inconsistent language and grammatical errors. By this amendment Claims 1 and 11 have had these issues corrected and these objections are now moot. Applicants request, therefore, that these objections be removed.

Claims 1 – 20 were rejected under 35 U.S.C. 103(a) as being unpatentable over Pinas (US 6,879,057) in view of Turner (US 6,646,845) and in further view of Tani (US 2004/0124703). Specifically, the Examiner states:

> With respect to claim 1, Pinas discloses electric power distribution architecture at two substantially different voltage levels (figure 1; column 5, lines 24 – 36), comprising:
>
> at least a first battery (figure 1, item B12; column 6, lines 1 – 8) at a first voltage level;
>
> a second battery (figure 1, item B36; column 5,

lines 46 –48) at a second, substantially higher voltage level, and intended as a differentiated electric power supply for respective network sectors (figure 1, items R14, R42);

said network sectors having power distribution units (figure 1, item 2; figure 2, item 8; column 5, lines 24 –36; column 6, lines 38 – 52) directing power to loads (figure 1, items 6 – 7; figure 2 items 35 – 38);

said at least first battery and sectors that is supplies being fed in turn from the second battery through a converter (figure 1, item 4; figure 2, item 1; column 5, lines 53 – 62; column 6, lines 8 – 13);

said second battery being connected to a voltage generator (figure 1, item A; column 5, lines 46 – 48).

Pinas does not expressly disclose the electric power distribution architecture comprises an automatic disconnection device, a microcontroller to monitor the state of the first battery, or microcontrollers contained within the power distribution units.

Turner discloses a system for protection against short-circuits in electric power distribution architectures (figure 1, item 10; column 4, lines 1 – 12; column 6, lines 18 – 22), comprising:

a first battery (figure 1, item 12; column 6, lines 43 – 46);

an automatic disconnection device (figure 1, item 14; column 6, lines 23 – 31 and 46 – 55; column 7, lines 1 – 4);

said first battery has an associated module SSM microcontroller (figure 1, item 26; column 7, lines 14 – 22 and 27 – 29; column 8, lines 5 – 10) monitoring the voltage and current at the posts of said battery and sensing an operating state of said converter (column 4, lines 35 – 46; column 7, lines 30 – 46);

The Turner battery discharges and supplies power to the loads when the ignition is off and recharges when the vehicle ignition is on (column 8, lines 11 – 14). Through sensing the state of charge of the battery, the Tun[r]er controller, when combined with the Pinas architecture, senses the *operating state* of the DC/DC converter. The operating state of the converter controls the charge/discharge function of the first battery, which is sensed by the Turner controller.

Pinas and Tu[r]ner are analogous because they are from the same filed of endeavor, namely automotive power distribution systems. At the time of the invention by applicants, it would have been obvious to one skilled in the art to combine the dual voltage system disclosed in Pinas with the short-circuit protection system disclosed in Turner. The motivation for doing so would have been to protect the electrical system in the event of a short-circuit, for example, during a car crash.

Tani discloses an electric power distribution architecture (figures 1 – 2; paragraphs 64 – 67), comprising:

a first battery (figure 1, item 103) with an associated module SSM microcontroller (figures 1 – 2, item 105; paragraphs 69 – 70, 73 and 75);

the power distribution units (figure 1, items 110a – 110e) are controlled by a corresponding microcontroller (paragraph 77, lines 1 – 6);

said module SMM microcontroller of battery B1 is connected through a port and a communications network (paragraph 70, lines 11 – 16) with each one of control microcontrollers of the power distribution units of the loads;

in order to, facing a short-circuit situation sensed by said module SMM microcontroller, according to the detection of a predetermined state of the converter, followed by predetermined, sensed voltage and current values, inform each on eof the microcontrollers of said power distribution units in order to activate said automatic disconnection device (paragraph 73, lines 4 – 12).

Tani discloses that the battery SMM microcontroller (105) senses the state of charge of the battery, and transmits the information to the power distribution unit microcontrollers. In the event of a short circuit, or other malfunction, the battery SMM microcontroller would transmit a message indicative of the event.

With respect to claims 2 and 3, Tani discloses the use of a communications network (figure 1, item 106). It would be obvious to one skilled in the art that a communications network amongst the plurality of microcontrollers would be either a dedicated network or a shared bus, as those are the common types of networks.

With respect to claims 4 – 5, Tani discloses that the controller is included in *an assembly* to measure the state of health and state of charge of the battery (figures 1 – 2, item 105) and to control and manage the loads fed by said battery (paragraph 67, lines 7 – 10; paragraph 70, lines 11 – 16).

With respect to claim 6, Pinas discloses power distribution units (figure 1, item 2; figure 2, item 8) that supply power to the loads from the low and high voltage batteries.

With respect to claims 7 – 8, Tani discloses the loads are *governed* by power switches (paragraph 67). Further, it would have been obvious to one skilled in the art to configure the power switches as FETs (column 6, lines 46 – 55), in order to allow the Tani PDUs (items 110) to control the switches through electric signals. The Tani PDU is not disclosed to contain any moving parts to activate a mechanical switch.

With respect to claim 9, Tani discloses sensing the voltage or impedance at the output of said power switches prior to said controlled load (paragraph 67). It would be obvious to one skilled in the art that the Tani sensors can be placed at various locations along the power transmission line between the battery and the load.

With respect to claim 10, it would be obvious to include another controller for monitoring and controlling a disconnection device for the second battery, since the mere duplication of the essential working parts of a device involves only routine skill in the art, *St. Regis Paper Co. v. Bemis Co.*, 193 USPQ 8 (CCPQ 1977).

With respect to claims 11 – 20, Pinas and Tu[r]ner disclose the apparatus necessary to complete the recited methods, as discussed above in the rejections of claims 1 – 10, respectively.

Applicant respectfully traverses this rejection as well as the Examiner's response to Applicants previous arguments to this same rejection earlier presented. The key to Applicants' invention is a distributed power management apparatus and method that utilizes at least one lower voltage battery and one substantially higher voltage battery in cooperative combination with a DC/DC converter and multiple controllers associated with load sectors controlled by a module SMM microcontroller to provide protection

against short-circuits which cause high voltage conditions and potential for damage to the electrical system, the loads, and the possibility of fire.

A fair reading of the Pinas (US 6,879,057) reference discloses an apparatus wherein a DC/DC converter is mounted within an existing distribution box (see for example, Col. 3, lines 7 – 15) requiring as a critical elements of a dedicated cooling system for said distribution box (see for example, Col. 4, lines 41 – 60) and the DC/DC converter being isolated on a separate circuit board or area of an existing circuit board (see for example, Col. 3, lines 18 – 23) and further characterized has having a non-electronic component containing blank area on the circuit board opposite the DC/DC converter having a conductive coating to provide at least RF shielding and preferably also heat sink function (see for example, Col. 3, lines 23 – 35 and Col. 3, lines 45 – 63). This reference is directed to providing RF shielding and vibration damage protection by moving the DC/DC converter into an existing distribution box instead of wiring a separate box to the vehicle's electrical system. It does not disclose, teach, or fairly suggest how to provide for protecting the electrical system or any of its constituent components in the presence of a short circuit. This reference also does not disclose, teach, or fairly suggest the desirability of providing such short circuit protection or the use of FET systems to provide short circuit switches.

A fair reading of the Turner (US 6,646,845) reference discloses a battery disconnect device (see for example, Col. 1, lines 30 – 40) utilizing a FET controlled switch to protect the voltage level of a battery by connection of the monitoring device to only the battery terminals (see for example, Col. 4, lines 21 – 26) and only monitors the SOC of the battery (see for example, Col. 4, lines 35 – 61). Additionally, this reference discloses that there is a critical requirement that this disconnect device can be bypassed completely (see for example, Col. 5, lines 59 – 65). Further this reference teaches that all of the components including the disconnect component and the reconnect component of the disclosed invention are independent of any other vehicle electrical/electronic systems (see for example, Col. 4, lines 21 – 26). This reference does not disclose, teach, or fairly suggest how to use this teaching to connect the battery protection device into the vehicle electrical system.

A fair reading of the Tani (US 2004/0124703) reference discloses a power distribution allocation system to prevent the loads to draw more voltage than the voltage source can supply. Instead this reference discloses a method to increase available power of the generator through variable speed control (see for example, paragraphs [0066], [0069], and [0073]). In addition, this reference teaches a method for providing some voltage to most if not all loads requesting power through the allocation of what is available in a dual layered priority system (see for example, paragraph [0020]). This reference does not disclose, teach, or fairly suggest how to use this teaching to connect a circuit including a DC/DC converter to provide dual voltage systems having at least 2 batteries at different voltage levels, nor how to isolate the disclosed device to only the battery of the vehicle and isolate it from the rest of the vehicle electrical system. In fact, this reference device can not work if it is not part of the vehicle electrical system as it has to be electrically connected to all vehicle loads as well as voltage sources to operate in its designed manner.

Clearly, no combination of the Pinas (US 6,879,057), Turner (US 6,646,845), and Tani (US 2004/0124703) references is possible. But even if any such combination was possible, which it is not, none of the references provide the legally required impetus to combine them or any parts of them to arrive at Applicants claimed invention. Pinas teaches how to place a DC/DC converter within an existing power distribution box of a vehicle electrical system, the Turner reference teaches a device that must be isolated from the vehicle electrical system, and the Tani reference teaches nothing about protecting against short circuits within a vehicle electrical system. The only way one skilled in the art can arrive at Applicants claimed invention by choosing particular bits of these references is to first have knowledge of Applicants claimed invention. Clearly, when viewed in this light this rejection is now moot and Applicant respectfully requests this rejection be removed.

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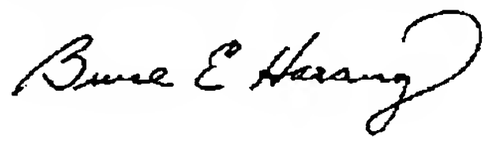
In view of the remarks herein, and the amendments hereto, it is submitted that this application is in condition for allowance, and such action and issuance of a timely Notice of Allowance is respectfully solicited.

Respectfully submitted,



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Attachments

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